



Visitors toured INL's materials science labs as part of the Advanced Test Reactor National Scientific User Facility Users Week.

Academics from around the country tour INL materials science labs

by [Mary O'Brien](#) and [Reuel Smith](#), *INL Communications*

Idaho National Laboratory's materials science labs played host to dozens of academics from across the country last month. The 75 participants were part of INL's [Advanced Test Reactor \(ATR\) National Scientific User Facility \(NSUF\)](#) "Users Week." Their INL Research Center (IRC) tour focused on different aspects of materials science research and included four labs where the next generation of nuclear reactor materials is being studied.

The user facility in general, and [Users Week](#) in particular, seeks to foster collaborations between academia, the commercial nuclear power industry and federal facilities such as INL. Through the facility, university research groups are now using INL's one-of-a-kind materials test reactor and other INL resources to test how new materials stand up to intense radiation.

Users Week supports a core INL belief that "Collaborative development of nuclear energy science and technology by three major sectors — academia, the commercial nuclear power industry and the federal government — is key to meeting challenges in the development of nuclear energy."

At this year's Users Week, academia was represented on every level — undergrads, graduate students and faculty — and from institutions as close as the University of Idaho and as far away as the Massachusetts Institute of Technology.

Richard Wright, INL's lead scientist for the [Next Generation Nuclear Plant \(NGNP\)](#) materials research program, presented an overview of materials science. He conveyed general program information, background about INL's capabilities, and some details about the research and labs the group would visit.



Laura Carroll, right, describes specialized creep-fatigue tests being conducted on Alloy 617.



Scientist and research lead Richard Wright describes complexities associated with elements of INL's nuclear materials research program.

"My co-researchers and I were glad to see so many people coming to INL to learn about the future of materials science, especially to learn about access to the Advanced Test Reactor," said Wright. "We're really proud of our capability to help outside users conduct their proprietary materials experiments."

Researchers in the [Materials Science and Engineering Department](#), managed by Tim Roney, gave the individual lab tours. In the metals testing lab, researchers Laura Carroll and Joel Simpson highlighted INL's creep-fatigue testing capabilities. They also described the tests they conduct on a material called Alloy 617 for the NGNP program.

The next stop on the IRC lab tour was with INL scientist Will Windes in his newly remodeled graphite characterization lab. Graphite is used in many parts of next-generation reactor cores. Windes explained the capabilities of the new lab and noted that a pending merger with an adjacent lab will bring state-of-the-art characterization equipment.

"Once this new equipment is installed, INL will be one of only a few facilities in the world with the specific capability to thermally, mechanically and physically characterize irradiated graphite," said Windes.

Tour attendees then continued to the laser-based materials characterization laboratory, where INL staff scientist David Hurley explained the success his techniques have had measuring how mechanical and thermal properties of materials change in high-radiation, high-temperature environments. Guests on the tour were particularly interested in this lab's capabilities, and asked in-depth questions related to the application of this technology to their respective research projects.

The last stop on the tour was with INL researcher Dave Swank. Swank explained the lab's role in

casting and welding test capsules destined for irradiation in the Advanced Test Reactor. He explained the expertise and technical equipment required and left tour members with a word of advice. "If you are a researcher, don't work in a bubble," Swank said, referring to possibly duplicating efforts and equipment.

In all, the tour of IRC labs demonstrated INL's unique materials science capabilities and planted seeds for potential collaborations with academic institutions throughout the country.

[Feature Archive](#)



INL researcher Dave Swank, center, uses a sample to explain the intricacies of packaging and welding small capsules to test irradiated materials for integrity.